

Under the Background of Industry-Education Integration--Real-Time Environmental Inspection--Exploration and Practice of Teaching Mode

Peng Wang

Xuzhou Institute of Technology, Xuzhou, Jiangsu 221000, China

Abstract: This article mainly discusses the application of real-time environmental monitoring technology in educational practices. It begins by introducing the basic principles of this technology, which involves real-time monitoring of environmental parameters through sensors and the use of data analysis and processing for real-time evaluation and feedback. It then delves into the specific applications of real-time environmental monitoring technology in teaching, including classroom instruction and laboratory practices. The article analyzes the advantages of this technology in teaching, such as real-time monitoring, objectivity, and personalization, while also addressing challenges such as sensor reliability and accuracy, teacher training, and strategy improvement. Finally, it provides methods and strategies to address the challenges in the application of real-time environmental monitoring technology, including improving sensor technology, enhancing teacher training, and refining teaching strategies. Overall, real-time environmental monitoring technology has significant potential for application in education, but it also requires addressing various technological and educational challenges.

Keywords: Industry-Teaching Integration; Real-Time Environmental Inspection; Teaching Model.

1. Introduction

The application of real-time environmental monitoring technology is becoming increasingly widespread in various fields, particularly in the field of education, where it has brought about many new possibilities for teaching practices. By continuously monitoring and assessing various parameters in the environment, teachers can gain a better understanding of students' learning environment and make corresponding adjustments and improvements as needed. This article will explore the specific applications of real-time environmental monitoring technology in teaching practices, while also analyzing its advantages and challenges, and providing solutions and strategies. Through in-depth research and exploration of the educational potential of real-time environmental monitoring technology, we can contribute to enhancing teaching quality and students' learning outcomes.

2. Fundamentals of Real-time Environmental Detection Technology

The basic principle of real-time environmental monitoring technology is to monitor various parameters in the environment through sensors. Sensors can perceive and measure parameters such as temperature, humidity, light intensity, and gas concentration in the environment. These sensors transmit the collected data to a data analysis and processing system for real-time evaluation and feedback. The data analysis system processes and analyzes the data collected by the sensors, and evaluates the state and quality of the environment based on predefined standards, indicators, or algorithms. Based on the evaluation results, teachers or relevant personnel can timely understand the situation of the environment and take corresponding measures as needed [1]. Through real-time monitoring and feedback, real-time environmental monitoring technology provides an objective,

accurate, and timely method for teaching practices, helping teachers better manage and adjust the learning environment, and providing a better teaching experience and learning outcomes.

3. Specific Use of Real-time Environmental Testing Technology in Teaching Practice

Firstly, real-time monitoring of classroom temperature and humidity can help teachers and students' study and work in a comfortable environment. If the temperature or humidity exceeds a reasonable range, sensors will promptly issue alerts to remind teachers to take necessary measures, such as opening windows for ventilation or turning on air conditioning. Secondly, real-time monitoring of light intensity ensures sufficient lighting in the classroom, which is beneficial for student concentration and improved learning outcomes. If the light is insufficient or too strong, sensors will provide prompts to help teachers make timely adjustments to curtains or lighting fixtures. In addition, real-time monitoring of gas concentrations in the environment is crucial, especially for harmful gases such as carbon dioxide and carbon monoxide. Sensors can detect the concentration of these gases in real-time and issue alerts when the levels exceed safety thresholds, ensuring the health and safety of students and teachers. Lastly, real-time environmental monitoring technology can be integrated with other smart devices, such as smart lighting systems, smart air conditioning systems, etc. Using data collected by sensors, these devices can automatically adjust lighting and air conditioning to create a more comfortable and suitable learning environment. In summary, real-time environmental monitoring technology has various specific applications in teaching practice, improving the quality of the learning environment and providing better learning outcomes and student experiences [2].

4. Strengths and Challenges of Real-Time Environmental Detection Technology in Teaching and Learning

The advantages of environmental real-time monitoring technology in education include providing a comfortable learning environment, ensuring student health and safety, as well as promoting energy conservation and environmental protection. Real-time monitoring of environmental parameters such as temperature, humidity, and lighting allows for timely adjustments to classroom conditions, creating a conducive learning environment that enhances student learning effectiveness and focus. Monitoring harmful gas concentrations, such as carbon dioxide and carbon monoxide, enables prompt alerting to ensure the health and safety of students and teachers. Additionally, real-time monitoring technology can help conserve energy by improving energy utilization efficiency and reducing energy consumption, thus achieving energy savings and environmental benefits. However, environmental real-time monitoring technology in education also faces challenges. Firstly, there is the cost of technology and equipment investment, as purchasing and maintaining the required sensors and devices can be expensive. Secondly, data analysis and processing are necessary to handle large amounts of real-time data and extract useful information, requiring relevant data analysis capabilities. Furthermore, privacy and security issues are significant challenges as environmental real-time monitoring involves data collection, storage, and transmission, necessitating the safeguarding of student and teacher privacy and data security. Despite these challenges, the advantages of environmental real-time monitoring technology in education are evident, as it can provide a better learning environment, enhance student learning effectiveness and ensure health and safety. With the continuous development of technology, these challenges can be gradually overcome.

5. Approaches and Strategies to Address Challenges in the Application of Real-Time Environmental Detection Technologies

5.1. Solutions to Sensor Reliability and Accuracy Issues

The methods and strategies to address the reliability and accuracy issues of sensors in the application of real-time environmental monitoring technology are crucial. The accuracy and reliability of sensors directly impact the reliability and effectiveness of real-time detection results; therefore, measures need to be taken to ensure the normal operation and data accuracy of sensors. Firstly, choosing high-quality sensors is key. When selecting sensors, factors such as technical specifications and certifications should be considered. High-quality sensors usually have higher accuracy and reliability, providing more precise real-time data. For specific environmental parameters like temperature, humidity, or light intensity, specialized sensors designed for those conditions can be chosen as they perform better in specific environmental conditions. Secondly, regular calibration and maintenance of sensors are important measures to ensure their accuracy and reliability. Sensors may

experience drift or failure after a period of use, and calibration can help restore their accuracy. Calibration should be performed according to the manufacturer's recommendations and standards, adjusting sensor readings by comparing them with known accurate values. Additionally, regular maintenance and care, such as cleaning the sensors and checking the integrity of connection lines, can prolong the lifespan of sensors and maintain accuracy. Thirdly, data quality validation and anomaly detection are essential approaches to ensure sensor accuracy and reliability. By comparing the data provided by sensors with other known data sources, the conformity of the sensor data can be verified, and data anomalies or sensor malfunctions can be detected [3]. When abnormalities are detected, appropriate measures can be taken, such as recalibration, replacing faulty sensors, or conducting repairs. Moreover, data integrity and security should also be emphasized. Ensuring the security and integrity of data collection, transmission, and storage processes is crucial to prevent data interference or tampering. Using encryption techniques for transmission and storage, establishing secure data channels, limiting access permissions, and implementing backup and recovery measures are necessary to protect data integrity and availability. In conclusion, the methods and strategies to address the reliability and accuracy issues of sensors in the application of real-time environmental monitoring technology include choosing high-quality sensors, regular calibration and maintenance, data quality validation and anomaly detection, as well as ensuring data integrity and security. Implementing these measures can enhance sensor performance, ensure the reliability and effectiveness of real-time detection results, and better support environmental monitoring applications in various contexts.

5.2. Measures to Improve Teachers' Technology Training and Teaching Strategies

5.2.1. Provide specialized technical training

Teacher technology training is a key initiative to enhance teachers' skills and improve teaching strategies. As educational technology continues to evolve and be implemented, teachers need to continuously update their technical knowledge and skills to provide valuable and effective learning experiences. Providing specialized technology training can help teachers meet this challenge. Firstly, specialized technology training helps teachers understand the latest trends and tools in educational technology. With constant advancements, innovative tools and applications such as online learning platforms, virtual reality and augmented reality technologies, and adaptive learning systems have emerged. Through professional training, teachers can learn the principles and applications of these new technologies, and understand how they can enhance teaching and provide students with richer and personalized learning experiences. Secondly, specialized technology training helps teachers improve their technical proficiency and application skills. Many teachers may feel unfamiliar or less proficient in using technology tools and applications, which can lead to subpar outcomes or issues during teaching. Through training, teachers can learn how to properly operate and utilize technology tools, grasp best practices for technical implementation, and enhance their proficiency and efficiency in utilizing technology to support student learning. Furthermore, specialized technology

training can assist teachers in refining their teaching strategies. The application of educational technology is not just about using flashy tools but rather combining technology with teaching strategies to improve student learning outcomes. Training can provide guidance and support for instructional design, enabling teachers to integrate technology tools into their curriculum to create more engaging, interactive, and personalized learning experiences. Teachers can learn how to design online interactive activities, utilize multimedia resources, provide immediate feedback, and promote active participation and deeper learning among students. Lastly, specialized technology training can facilitate collaboration and learning networks among teachers. Training programs and activities offer opportunities for teachers to exchange ideas and share experiences, enabling mutual learning and inspiration in tackling technological applications and teaching challenges. This collaborative and learning network contribute to professional development and growth among teachers, providing a platform for mutual support and feedback. In conclusion, providing specialized technology training is an essential measure to enhance teachers' skills and improve teaching strategies. By helping teachers stay updated on the latest trends and tools in educational technology, enhancing their technical proficiency and application skills, refining their teaching strategies, and fostering collaboration and learning networks, overall teaching capabilities can be improved, and student learning outcomes can be enhanced. Schools and educational institutions should prioritize and provide ongoing professional technology training opportunities for teachers to ensure their competitiveness and adaptability in the rapidly changing educational landscape [4].

5.2.2. Encourage teachers to participate in professional development activities

Encouraging teachers to participate in professional development activities is crucial for enhancing their professional qualifications and improving teaching quality. Firstly, professional development activities help teachers continuously update their knowledge and skills. The field of education is constantly evolving, and participating in professional development activities allows teachers to stay informed about the latest research findings, educational policies, and teaching practices. This helps teachers stay aware of the latest trends in education and apply the newest theories and practices to their teaching. Secondly, professional development activities provide abundant learning opportunities and resources. Teachers can engage in seminars, workshops, conferences, and other activities to exchange ideas and collaborate with peers, sharing experiences and teaching strategies. Additionally, professional development activities offer learning resources such as teaching materials and curriculum design examples, helping teachers acquire more teaching tools and methods. Thirdly, professional development activities stimulate teachers' innovation and exploration. By participating in such activities, teachers can be exposed to different teaching philosophies and practices, gaining knowledge about various teaching methods and assessment approaches. This fosters a sense of innovative thinking among teachers, inspiring them to experiment with new teaching strategies and classroom models, thereby enhancing the quality of teaching and student learning outcomes. Furthermore, professional development activities provide valuable support and opportunities for career growth. Teachers can build professional connections and collaborations through interactions and learning from

peers. Additionally, some professional development activities offer certifications and credentials, contributing to the recognition and advancement of teachers' professional development.

5.2.3. Create a mentorship system

Creating a mentorship program is an effective approach to support teachers' growth and enhance teaching quality. Firstly, a mentorship program provides guidance and support to new teachers. New teachers face various challenges and uncertainties when entering the education field. Through a mentorship program, new teachers can receive guidance and assistance from experienced mentors, including familiarizing themselves with the school's culture and teaching environment, sharing teaching techniques, and receiving advice on classroom management. This helps new teachers adapt to their teaching roles more quickly and improve their teaching abilities. Secondly, a mentorship program promotes collaboration and communication among teachers. Mentors not only provide guidance to new teachers, but they also serve as a platform for teachers to learn from and support each other. Mentors can share teaching resources, experiences, and best practices with other teachers, engage in collaborative teaching or classroom observations, and provide opportunities for professional development and growth. This collaboration and communication contribute to the overall improvement of the teaching quality and the professional competence of the entire teaching team. Thirdly, a mentorship program helps maintain teachers' professional motivation and provides career development opportunities. Throughout their teaching careers, teachers may face professional burnout or a lack of growth challenges. Through a mentorship program, teachers can receive continuous professional support and encouragement. Mentors can help teachers develop career development plans, provide opportunities and resources for professional development, and assist teachers in achieving personal and professional goals. Additionally, a mentorship program helps establish a positive educational culture and teaching team. Through the mentorship program, teachers develop closer relationships and collaborative partnerships, facilitating the sharing of teaching experiences and professional knowledge. This culture of collaboration and support can break down the isolation among teachers, increase job satisfaction, and improve the quality of teaching. In summary, creating a mentorship program is a significant pathway for teachers' growth and improving teaching quality. It offers guidance and support to new teachers, promotes collaboration and communication among teachers, sustains teachers' professional motivation, and establishes a positive educational culture and teaching team. Schools and educational institutions should prioritize the establishment of mentorship programs and provide necessary training and support to mentors and teachers, creating an environment that supports teachers' growth and high-quality teaching [5].

5.2.4. Provide technical support and resources

Providing adequate technical support and resources is crucial when establishing a mentorship program. It is essential for mentors to effectively communicate and collaborate with new teachers, ensuring they can fulfill their roles as mentors and provide guidance. To address the need for technical support, a range of measures can be taken to meet the requirements of mentors and new teachers. Firstly, we can ensure that mentors and new teachers can conveniently use and leverage existing technology tools and platforms. This includes offering training to familiarize them

with commonly used tools such as online communication tools, email, video conferencing software, and more. Training can be provided in the form of online video tutorials, presentations, face-to-face sessions, etc., to ensure they have a comprehensive understanding of how to use these tools effectively. Secondly, we should provide rich teaching resources to support mentors in their instructional work. These resources can include curriculum plans, teaching outlines, teaching activities, instructional materials, and reference materials, among others. These resources should be easily accessible and shareable, allowing mentors and new teachers to access and exchange them via online platforms or shared documents. This way, mentors can better prepare their instructional content and provide assistance and guidance to new teachers. Additionally, establishing a technical support channel or help desk can serve as a resource where mentors and new teachers can seek assistance when encountering issues with technology tools. This channel can be an online support platform, providing real-time assistance and offering guides to address frequently asked questions. Furthermore, setting up a dedicated team to address mentors' and new teachers' technical queries and provide additional support and guidance can be beneficial. Moreover, creating an online social platform or dedicated communication channel can facilitate interaction, experience sharing, and seeking help between mentors and new teachers. This platform can take the form of a forum, social media groups, or specialized online platforms. Mentors and new teachers can utilize this platform to share teaching experiences, raise questions, seek advice, and learn from one another. In conclusion, providing technical support and resources is vital for a mentorship program. By offering training, rich teaching resources, technical support channels, and communication platforms, we can ensure mentors and new teachers can effectively utilize technology tools, prepare instructional content, engage in productive communication and collaboration, ultimately providing high-quality guidance and support.

5.2.5. Emphasis on educational psychology

Educational psychology plays a crucial role in improving teacher training and teaching strategies. Firstly, educational psychology studies the psychological principles and factors involved in the learning process, helping teachers understand students' cognition, emotions, and behaviors. This understanding provides valuable insights for teachers to better meet students' learning needs. By understanding different students' learning styles, motivations, and preferred learning strategies, teachers can adjust their teaching methods and classroom strategies accordingly, providing a more effective learning experience for each student. Secondly, educational psychology provides a knowledge base of learning theories and cognitive science, helping teachers understand the nature of learning and key elements in the learning process. Through studying different learning theories such as behaviorism, cognitivism, and constructivism, teachers can grasp how students receive, process, and integrate knowledge. This theoretical understanding guides teachers in designing targeted instructional activities and tasks, promoting deep learning and knowledge construction. Educational psychology also offers effective classroom management strategies to help teachers create a positive learning environment and enhance student engagement. Teachers

understand students' emotional states and social interaction needs, and can apply psychological principles to manage the classroom, establish positive teacher-student relationships, and stimulate student motivation. Moreover, research in educational psychology involves aspects such as learning motivation, learning strategies, and self-regulation. This knowledge guides teachers in fostering collaboration, encouraging self-directed learning, and providing effective feedback in the classroom, maximizing students' learning outcomes. Furthermore, educational psychology provides teachers with effective assessment and feedback tools to help them understand students' learning progress and identify the reasons for learning difficulties. Teachers can employ psychological measurement and evaluation methods to collect student learning data and feedback, thereby accurately identifying students' learning needs and challenges. Based on this information, teachers can adjust their teaching strategies and provide personalized support, promoting students' learning development.

6. Conclusion

In the context of industry-education integration, real-time environmental monitoring technology plays an important role in exploring and practicing teaching methods. By collecting and analyzing environmental data in real-time, this technology can provide scientific evidence and references for teaching, as well as real-time feedback and guidance. However, the application of real-time environmental monitoring technology also faces some challenges that require joint efforts from educational institutions and teachers to address. In the future, real-time environmental monitoring technology will be combined with other cutting-edge technologies to bring more innovation and improvements to education.

References

- [1] Chen J. Research on the Application of Teaching Integration Mode in Business English Teaching in Higher Vocational Colleges[C]//Institute of Management Science and Industrial Engineering. Proceedings of 2019 8th International Conference on Social Science, Education and Humanities Research (SSEHR 2019). Francis Academic Press, 2019:344-348.
- [2] Fujiang D, Liu Y. Practice of autonomous learning teaching model under online teaching[J]. Computer Informatization and Mechanical System, 2023(1):6.
- [3] Shen L. Research on the Cultivation of English Teachers' Informatization Technology Literacy and Teaching Integration Ability[C]//Institute of Management Science and Industrial Engineering. Proceedings of 2019 International Conference on Arts, Management, Education and Innovation(ICAMEI 2019). Clausius Scientific Press, 2019:931-935.
- [4] Li S. Research on English Teaching Model in Universities under the Perspective of Big Data[J]. The Educational Review, USA, 2023:66.
- [5] Mathematical A C M I M. Retracted: Research on Classroom Online Teaching Model of "Learning" Wisdom Music on Wireless Network under the Background of Artificial Intelligence[J]. Computational and Mathematical Methods in Medicine, 2022:19-20.